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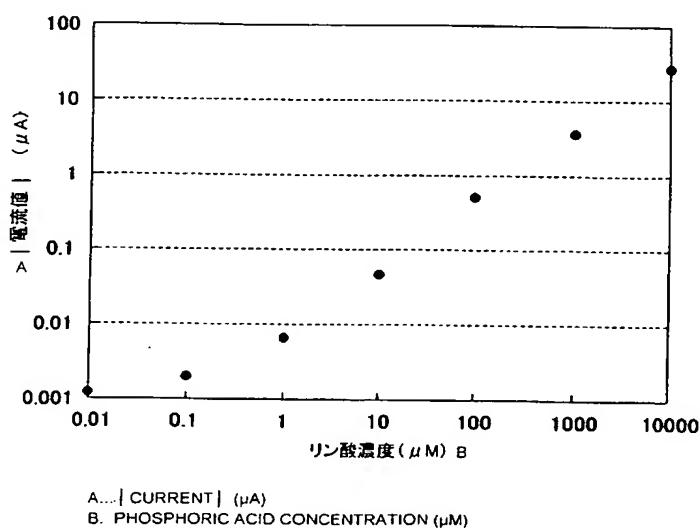
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[続葉有]

(54) Title: METHOD OF DETECTING INORGANIC PHOSPHORIC ACID, PYROPHOSPHORIC ACID AND NUCLEIC ACID AND METHOD OF TYPING SNP SEQUENCE OF DNA

(54) 発明の名称: 無機リン酸、ピロリン酸及び核酸の検出方法並びにDNAのSNP配列をタイピングする方法



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(57) Abstract: Inorganic phosphoric acid is detected by a method comprising: the step of applying a sample to an assay system containing glyceraldehyde-3-phosphate, oxidized nicotinamide adenine dinucleotide or oxidized nicotinamide adenine dinucleotide phosphate, glyceraldehyde phosphate dehydrogenase and an electron mediator; and the step of measuring the electric current in the assay system. Pyrophosphoric acid is highly sensitively, quickly and quantitatively measured by replacing the pyrophosphoric acid in a sample in the above method by inorganic phosphoric acid. By the method of assaying pyrophosphoric acid as described above, pyrophosphoric acid formed in association with DNA extension is quantified. Thus, the presence/absence of an aimed nucleic acid and bases at the aimed SNP site of DNA are typed.

(57) 要約: 本発明は、グリセラルデヒド-3-リン酸、酸化型ニコチンアミドアデニンジヌクレオチド又は酸化型ニコチンアミドアデニンジヌクレオチドリン酸、グリセラルデヒドリン酸で

[続葉有]



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(81) 指定国(国内): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) 指定国(広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

添付公開書類:  
— 國際調査報告書

2 文字コード及び他の略語については、定期発行される各 PCT ガゼットの巻頭に掲載されている「コードと略語のガイドスノート」を参照。

ヒドロゲナーぜ、および電子メディエータを含む測定系に試料を供する工程: および該測定系において電流値を測定する工程を包含する方法によって無機リン酸を検出する。上記方法において、試料中のピロリン酸を無機リン酸に変換して、ピロリン酸を高感度、高速、かつ定量的に測定する。このようなピロリン酸の測定によって、DNA の伸長に伴って生成されるピロリン酸を定量し、目的とする核酸の有無および目的とするDNAのSNP部位の塩基をタイピングする。

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/03146

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> C12Q1/32, C12Q1/34, C12Q1/48, C12Q1/68, G01N27/416,  
G01N33/53, G01N33/566, G01N33/84

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> C12Q1/32, C12Q1/34, C12Q1/48, C12Q1/68, G01N27/416,  
G01N33/53, G01N33/566, G01N33/84

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
WPI, BIOSIS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00/04378 A (Sapporo Immuno Diagnostic Laboratory), 27 January, 2000 (27.01.00), & EP 1098193 A	1-6
A	WO 98/28440 A (PYROSEQUENCING AB), 02 July, 1998 (02.07.98), & EP 946752 A & JP 2001-506864 A	1-10
A	WO 92/21776 A (TOYO JOZO KABUSHIKI KAISHA), 10 December, 1992 (10.12.92), & JP 04-349898 A	1-6
A	EP 663447 A (EIKEN CHEM CO., LTD.), 19 July, 1995 (19.07.95), & US 5849487 A & JP 07-231799 A	1-10

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	
"A"	document defining the general state of the art which is not considered to be of particular relevance
"E"	earlier document but published on or after the international filing date
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O"	document referring to an oral disclosure, use, exhibition or other means
"P"	document published prior to the international filing date but later than the priority date claimed
"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&"	document member of the same patent family

Date of the actual completion of the international search 15 April, 2003 (15.04.03)	Date of mailing of the international search report 30 April, 2003 (30.04.03)
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Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/03146

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99/57321 A (UNIV ALBERTA), 11 November, 1999 (11.11.99), & EP 1082458 A & JP 2002-513594 A	1-10
A	EP 665293 A (HAMAMATSU PHOTONICS KABUSHIKI KAISHA), 02 August, 1995 (02.08.95), & JP 07-203998 A	1-10
P,A	JP 2003-000299 A (Fuji Photo Film Co., Ltd.), 07 January, 2003 (07.01.03), (Family: none)	1-10